



Geotechnical
Environmental
Water Resources
Ecological

Phase I and II Environmental Site Assessment

Powder House School
1060 Broadway
Somerville, Massachusetts

Submitted to:

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Boston, MA 02210

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March 6, 2014

Project 133263-0



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Table of Contents

Executive Summary	iv
1. Introduction	1
1.1 Purpose	1
1.2 Detailed Scope of Services	1
1.3 Significant Assumptions	2
1.4 Limitations and Exceptions	2
1.5 Special Terms and Conditions	2
1.6 User Reliance	3
2. Property Description	4
2.1 Property Location and Legal Description	4
2.2 Site Vicinity and General Characteristics	4
2.3 Current Use of the Property	4
2.4 Description of Structures, Roads, and Other Improvements on the Property	4
2.5 Current Use of the Adjoining Properties	4
3. User Provided Information	5
3.1 Title Records	5
3.2 Environmental Liens or Activity and Use Limitations	5
3.3 Specialized Knowledge	5
3.4 Commonly Known or Reasonably Ascertainable Information	5
3.5 Valuation Reduction for Environmental Issues	5
3.6 Owner, Property Manager, and Occupant Information	5
3.7 Reason for Performing ESA	5
4. Records Review	6
4.1 Standard Environmental Records Sources	6
4.1.1 Hazardous Waste Sites and Spills	6
4.1.2 Registered and/or Leaking Underground and Aboveground Storage Tanks	6
4.1.2.1 Registered USTs and Leaking USTs	6
4.1.2.2 Registered ASTs and Leaking ASTs	7
4.1.3 Other Federally or State Listed Sites	7
4.2 Additional Environmental Records Sources	8
4.2.1 MassDEP Database Review	8
4.3 Physical Setting Sources	9
4.3.1 Surface Topography	9
4.3.2 Geologic Setting	9
4.3.3 Hydrogeologic Setting	9
4.4 Historical Use Information on the Property	10

4.5	Historical Use Information on Adjoining Properties	10
5.	Summary of Previous Environmental Reports	11
6.	Site Reconnaissance	12
6.1	Building Interior Observations	12
6.1.1	Building Heating	13
6.1.2	Stains or Corrosion	13
6.1.3	Drains or Sumps	13
6.1.4	Wastewater Disposal	13
6.2	Site Exterior Observations	13
6.2.1	Site Description	13
6.2.2	Pits, Ponds, and Lagoons	14
6.2.3	Stained Soil or Pavement	14
6.2.4	Odors and Stressed Vegetation	14
6.2.5	Solid Waste	14
6.2.6	Wells	14
6.3	Oil/Chemical Storage	14
6.3.1	Current Chemical Storage/Waste Generation	14
6.3.2	Past Chemical Storage/Waste Generation	14
6.4	On-Site Storage Tanks	14
6.4.1	Underground Storage Tanks	14
6.4.2	Aboveground Storage Tanks	15
6.5	PCB-Containing Equipment	15
6.6	Surficial Dumping	15
7.	Interviews	16
7.1	Interview with Owner and Property Manager	16
7.2	Interview with Local Government Officials	16
7.2.1	Assessor's Office	16
7.2.2	Board of Health	16
7.2.3	Inspectional Services Department (ISD)	16
7.2.4	Department of Public Works	17
7.2.5	Engineering Department	17
7.2.6	Fire Prevention Office	17
8.	Phase I ESA Findings	18
9.	Phase I ESA Opinion and Conclusions	19
10.	Phase II ESA Subsurface Investigation	20
10.1	Boring Advancement and Soil Sampling	20
10.1.1	Sample Collection	20
10.1.2	Findings	21
10.1.2.1	Geology	21

10.1.2.2	Soil Testing Results	21
10.2	Groundwater Monitoring Well Installation	22
10.3	Groundwater Sampling	22
10.3.1	Sample Collection and Testing	22
10.3.2	Findings	22
11.	Phase II ESA Summary	23
11.1	Findings	23
12.	Deviations	24
13.	Additional Services	25
14.	Environmental Professionals Statement	26
15.	References	27

Tables

1. Property Abutters
2. MassDEP-listed Disposal Sites and Spills within 0.25-mile Radius of the Property
3. Laboratory Testing Results – Soil Samples
4. Laboratory Testing Results – Groundwater Samples

Figures

1. Property Location Map
2. Property Plan

Appendices

- A. GEI Standard Terms and Conditions
- B. Environmental Data Resources (EDR) Report
- C. MassGIS Map
- D. Sanborn Fire Insurance Map Report
- E. Aerial Photographs
- F. Historic Topographic Maps
- G. City of Somerville Records
- H. Site Visit Photographs
- I. Boring Logs and Monitoring Well Installation Log
- J. Laboratory Data Reports
- K. Resumes

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Executive Summary

GEI Consultants, Inc. completed an ASTM Phase I and II Environmental Site Assessment (ESA), on behalf of ADD Inc. and Tufts University, for the Powder House School located at 1060 Broadway in Somerville, Massachusetts (the Property).

Based on our evaluation of current Property conditions and the review of available Property records, we identified one recognized environmental condition (REC), defined as evidence of past, current or future potential releases of oil and hazardous material (OHM), at the Property:

- The Property is a filled stone quarry. Between 1900 and 1934, the stone quarry was filled. Following the filling the Property was developed with a playground and school. The source of the material used to fill the quarry is unknown and could potentially contain OHM. Depending on the type and concentrations of OHM, the fill material may also represent a reportable condition under the Massachusetts Contingency Plan (MCP; 310 CMR 40.0000), and/or require management during excavation for construction.

We did not identify any historic RECs (HRECs), defined as a past release of OHM that has achieved regulatory closure without required controls or conditions (e.g. activity and use limitations [AULs] or engineering controls), nor did we identify any controlled RECs (CRECs), defined as a past release of OHM that has achieved regulatory closure with required conditions or controls.

Based on the presence of the REC at the Property, we recommended performing an ASTM Phase II ESA to evaluate whether a release of OHM to the environment has occurred that has affected the Property.

We conducted a Phase II ESA subsurface investigation in February 2014 to evaluate the REC. The subsurface investigation entailed drilling three soil borings, installing one groundwater monitoring well, and collecting soil and groundwater samples for laboratory analysis. The subsurface investigation indicated that:

- A soil sample collected from fill in boring B102 contained polycyclic aromatic hydrocarbons (PAHs) at concentrations that exceed Massachusetts Contingency Plan (MCP; 310 CMR 40.0000) soil category S-1 reportable concentrations (RCS-1). This is a 120-day reporting condition.
- A groundwater sample collected from monitoring well B103(MW) contained C₁₉-C₃₆ aliphatic hydrocarbons at a concentration well below reportable concentrations.

The presence of the PAHs in excess of the RCS-1 is a 120 day reporting condition. The owner of the Property is obligated to notify the Massachusetts Department of Environmental Protection (MassDEP) within 120 days of obtaining knowledge of the release. If the Property is sold prior to notification, the new owner is obligated to report to MassDEP within 120 days of taking ownership.

The presence of PAHs in the soil sample is a reportable concentration; however, due to the presence of coal and coal ash in the fill, the release qualifies for a reporting exemption under the MCP as identified in 310 CMR 40.0317(9) and 40.0317(12). Therefore, the owner may elect not to report the release to the MassDEP.

1. Introduction

GEI Consultants, Inc. has completed a Phase I and II Environmental Site Assessment (ESA), on behalf of ADD Inc. and Tufts University, for the Powder House School located at 1060 Broadway in Somerville, Massachusetts (the Property; Fig. 1).

1.1 Purpose

The purpose of the Phase I ESA was to:

- Identify recognized environmental conditions (RECs), defined by ASTM as a condition with the potential for a past, current, or future release of oil or hazardous material (OHM) at the Property.
- Identify historic RECs (HRECs); defined by ASTM as a past release of OHM that has achieved regulatory closure without required controls or conditions.
- Identify controlled RECs (CRECs); defined by ASTM as a past release of OHM that has achieved regulatory closure with required controls or conditions.
- Evaluate the potential for a release of Oil and Hazardous Materials (OHM) at the Property.

We performed a Phase I ESA in January 2013. We identified one REC which is that the Property is a filled stone quarry, the source of the material used to fill the quarry is unknown and could potentially contain OHM (further described below in this report). Based on the presence of the REC, we recommended a Phase II ESA.

The purpose of the Phase II ESA was to evaluate the identified REC, and determine whether the material used to fill the former stone quarry constitutes a release of OHM to the environment.

1.2 Detailed Scope of Services

In accordance with our proposal dated December 6, 2013, and authorized on December 23, 2013, we:

- Reviewed available records at City of Somerville offices.
- Reviewed documents and maps regarding local geologic and hydrogeologic conditions in the vicinity of the Property.

- Reviewed federal and state regulatory database records pertaining to the Property and surrounding area.
- Performed a site reconnaissance at the Property.
- Performed a subsurface investigation, including boring advancement, groundwater monitoring well installation, and soil and groundwater sampling.
- Prepared this Phase I and II ESA.

This report summarizes the information that we gathered as part of the ESA.

1.3 Significant Assumptions

Our conclusions and recommendations are based on the information sources presented in this report and listed in Section 13 (References), and a site reconnaissance at the Property. GEI assumes that all available information obtained as part of this ESA including database records, interview information, and historic information is accurate and reliable.

1.4 Limitations and Exceptions

This report meets the general requirements for a Phase I ESA established by ASTM Standard E1527 13, and a Phase II ESA established by ASTM Standard E1903-97 (2002) with the following exceptions:

- A review of available records maintained by municipal offices was used to substitute for interviews with employees of those departments who were unable to be interviewed at length.
- No title search was performed to identify previous owners. Readily available public documentation, including, but not limited to, aerial photographs, regulatory database searches, etc. were used in a lieu of a title search.
- A review of available records was used to substitute for interviews with past owners and managers of the Property who were unable to be interviewed at length.

Our conclusions are based on the information reported in this report. Additional information not available to us at the time this report was prepared may result in a modification of the findings of this ESA.

1.5 Special Terms and Conditions

This Phase I and II ESA was performed with no Special Terms and Conditions.

1.6 User Reliance

This report was prepared for the use of ADD, Inc. and Tufts University, exclusively. Reliance on this report by others is conditioned on acceptance of all of the terms and conditions contained in our “Standard Professional Services Agreement”, a copy of which is in Appendix A, and on the limitations in Section 1.4 of this report.

2. Property Description

2.1 Property Location and Legal Description

The Property is located at 1060 Broadway near Teele Square in northwest Somerville, Massachusetts (Fig. 1). The Property is currently owned by The City of Somerville [1].

The Property is a total of 1.86 acres and is improved with an approximately 39,136 square foot (ft²), multi-level (2 and 3 story) vacant school building and an approximately 35,000 ft² asphalt school yard.

The latitude and longitude of the Property are 42°24'06.48"N and 71°07'30.36"W, and UTM coordinates for the Property are 4,696,362.5 mN and 325,107.2 mE [2].

2.2 Site Vicinity and General Characteristics

According to the Somerville Assessor's Office, the Property is zoned for residential use [1]. The address, assessor's parcel identification number, owner, and use of each of the abutting properties are summarized in Table 1. The abutters include a Tufts University Administration Building at 169 Holland Street, and residences on Broadway, Packard Avenue and Paulina Street. The Tufts University campus is located approximately ¼ mile north of the Property [1].

2.3 Current Use of the Property

The Property is a vacant elementary school [1, 3].

2.4 Description of Structures, Roads, and Other Improvements on the Property

The Property consists of a 39,136 ft², multi-level (2 and 3 story) vacant school building and an adjacent 35,000 ft² asphalt school yard. The school building has a brick masonry exterior and a tar, gravel, and rubber roof. There are no roads or driveways on the Property; however the Property is accessible on foot via Broadway and Holland Street (Fig. 2) [1, 3].

2.5 Current Use of the Adjoining Properties

With the exception of the Tufts Administration Building at 169 Holland Street, abutting properties are residences on Broadway, Packard and Paulina Streets. The address, assessor's parcel identification number, owner, and use of each of the abutting properties are summarized in Table 1 [1, 3].

3. User Provided Information

3.1 Title Records

A title search was not performed as part of this ESA.

3.2 Environmental Liens or Activity and Use Limitations

There are no Activity and Use Limitations (AULs) for the Property, nor are there any known environmental liens [2, 4, 5].

3.3 Specialized Knowledge

No specialized knowledge or experience related to the Property was provided by the user of this ESA (ADD Inc. and Tufts University) [5].

3.4 Commonly Known or Reasonably Ascertainable Information

The user of this ESA (Add Inc. and Tufts University) did not provide GEI with any commonly known or reasonably ascertainable information within the local community that is relevant to identifying RECs at the Property [5].

3.5 Valuation Reduction for Environmental Issues

A purchase price has not yet been negotiated [5].

3.6 Owner, Property Manager, and Occupant Information

The Property is currently occupied by a vacant elementary school owned by The City of Somerville [1, 3, 5].

3.7 Reason for Performing ESA

GEI has completed this ESA, on behalf of ADD, Inc. and Tufts University, as part of the due diligence for a potential real estate transaction.

4. Records Review

4.1 Standard Environmental Records Sources

Environmental Data Resources (EDR) of Milford, Connecticut conducted a search of federal and state databases for sites within approximately 1 mile of the Property [2]. A copy of the EDR report is in Appendix B.

4.1.1 *Hazardous Waste Sites and Spills*

There are 118 State Hazardous Waste Sites (SHWS) located within 1-mile of the Property [2]. Most of these sites are likely too far away to affect conditions at the Property. A summary of the sites closest to the Property are described below.

There are 46 SHWS located within 0.5 mile of the Property. These sites are listed in Table 2. Forty-four of the forty-six sites have achieved closure with a Response Action Outcome (RAO) or require no further action.

Four of the forty-four sites that require no further action are classified as Downgradient Property Status (DPS) sites. All of these sites are located downgradient or crossgradient of the Property and are therefore unlikely to affect conditions at the Property.

Two of the forty-six sites are still open: 63 Gorham Street (Massachusetts Department of Environmental Protection [MassDEP] Release Tracking Number [RTN] 3-13686) and 1284 Broadway (RTN 3-2020). However, these sites are located downgradient or crossgradient from the Property and are, therefore, unlikely to affect conditions at the Property.

4.1.2 *Registered and/or Leaking Underground and Aboveground Storage Tanks*

4.1.2.1 Registered USTs and Leaking USTs

There is one registered underground storage tank (UST) site and twelve leaking UST (LUST) sites located within approximately 0.5 mile of the Property [2].

The registered UST site is the M.W. Carr Company facility located at 63 Gorham Street [2]. An 8,000 gallon fuel oil UST was removed from the facility in December 1990. Four separate releases have been reported to the Massachusetts Department of Environmental Protection for this facility (RTNs 3-13287, 3-13288, 3-13289, and 3-13686). Except for the site identified by RTN 3-13686, all of these sites have achieved an RAO. The remaining

open site is not expected to affect conditions at the Property since it is located downgradient [2].

Eleven of the twelve of the LUST sites have achieved closure with an RAO, or require no further action and are, therefore unlikely to affect conditions at the Property. The remaining LUST site, 5 Cameron Avenue (RTN 3-18951), has been classified as DPS, but is not expected to affect conditions at the Property since it is located downgradient of the Property [2].

4.1.2.2 Registered ASTs and Leaking ASTs

Within 0.5 mile of the Property, there are no registered aboveground storage tank (AST) sites, but there are three leaking AST (LAST) sites. All three of the LAST sites have achieved closure with an RAO and are unlikely to affect conditions at the Property [2].

4.1.3 Other Federally or State Listed Sites

According to the EDR report, there are no National Priority List (NPL) sites, Comprehensive Environmental Response, Compensation, and Liability Act (CERCLIS) sites, or Resource Conservation and Recovery Act (RCRA) Corrective Action (CORRACTS) sites within 1 mile of the Property. The former Craig Supply Company site located at 99 Elmwood Street is listed as a CERCLIS No Further Response Action Planned site (CERC-NFRAP), and has been removed from the inventory of CERCLIS sites because it is no longer considered to be a potential NPL site. This site is located downgradient of the Property and is not expected to affect conditions at the Property [2].

According to the EDR report, none of the following sites are on the Property or within approximately 0.5-mile of the Property; landfill/solid waste disposal sites or RCRA Treatment, Storage, or Disposal Facilities (TSDs).

The M.W. Carr Company site located at 63 Gorham Street is listed as a federally designated brownfields site, but is located downgradient of the Property and, therefore, not expected to affect conditions at the Property [2].

The Property is not an Emergency Response Notification System (ERNS) site [2].

According to the EDR report, there are no RCRA Large or Small Quantity Generator sites on the Property. There are 5 RCRA Non-Generators, 3 MassDEP Hazardous Waste Generators, and 1 RCRA-Conditionally Exempt Small Quantity Generator (CESQG) located within 0.25 miles of the Property. A MassDEP Hazardous Waste Generator is a permanent generator of hazardous waste and waste oil registered with MassDEP. A RCRA-CESQG generates less than 100 kilograms (kg) of hazardous waste annually or less than 1 kg of acutely hazardous waste per month. A RCRA Non-Generator does not currently generate

hazardous waste, but did in the past. With the exception of the M.W. Carr Company, a RCRA Non-Generator, no violations have been reported for any of these generator sites. Consequently, the presence of these sites and their past or current use of OHM are unlikely to affect conditions at the Property. The M.W. Carr Company site has had violations in the past, but is currently listed as a non-generator. This site is likely down-gradient of the Property and unlikely to affect conditions there [2].

The EDR Report identified four historical auto stations within 0.25 miles of the Property at 18 Clarendon Street, 42 Clarendon Street, 13 Jay Street, and 16 Jay Street. Both of the Jay Street sites are likely downgradient and are unlikely to affect conditions at the Property. The two Clarendon Street sites are likely cross-gradient, and greater than 0.125 miles from the Property and therefore, are unlikely to affect conditions at the Property. [2].

The EDR Report identified one currently operating drycleaner and three historical drycleaners within 0.25 miles of the Property. The currently operating drycleaner, Chris Fine Dry Cleaners at 1169 Broadway, is located potentially upgradient of the Property. However, the drycleaner site does not currently use perchlorethylene (PCE) in its operations, and no releases of OHM have been reported to MassDEP. This site is also greater than 0.125 miles from the Property. Therefore this drycleaner site is unlikely to affect conditions at the Property.

One of the historical drycleaners located at 85 Holland Street is likely down gradient of the Property and is unlikely to affect conditions at the Property. Although the two remaining historic drycleaners at 1141 and 1164 Broadway are likely up gradient, they are greater than 0.125 mile from the Property and are therefore unlikely to affect conditions at the Property.

4.2 Additional Environmental Records Sources

4.2.1 *MassDEP Database Review*

We reviewed the most recent, available MassDEP lists of confirmed disposal sites and reported releases in Somerville [6]. We also reviewed the MassDEP historical releases database to identify releases that occurred between 1980 and 1993 [7].

There are no MassDEP-listed sites at the Property; however, there are forty-six MassDEP-listed sites within 0.5 miles of the Property. As described in Section 4.1, only two of the forty-six sites are still open: 63 Gorham Street (RTN 3-13686) and 1284 Broadway (RTN 3-2020). However, these sites are located downgradient or crossgradient from the Property and are, therefore, unlikely to affect conditions at the Property [2].

4.3 Physical Setting Sources

4.3.1 Surface Topography

The Property is relatively flat, but slopes slightly downward to the east along Broadway. Based on the U.S. Geological Survey Topographic map for the Boston North Quadrangles (7.5-minute series), the surface elevation of the Property is approximately 40 feet above the North American Vertical Datum (NAVD) of 1988 [8].

4.3.2 Geologic Setting

We performed a subsurface investigation at the Property in February 2014 (refer to Section 10), including advancing soil borings, installing monitoring wells, and collecting soil and groundwater samples. The borings generally contained granular fill over shallow bedrock. Urban fill containing coal and ash fragments was encountered in one boring (B102). Based on boring refusal, bedrock was likely encountered in all of the borings, at depths ranging from 7.25 to 10 feet. We cored approximately 3.5 feet of bedrock in B101, from 13 to 16.5 feet. The soil conditions are known only at the boring locations, and the boring logs are attached in Appendix I.

The geology consists of unconsolidated surficial deposits of fill and consolidated bedrock. Bedrock in the area is Cambridge Argillite [11].

4.3.3 Hydrogeologic Setting

During our subsurface investigation in February 2014 we installed one groundwater monitoring well at the Property. Depth to groundwater was measured at 11.96 feet prior to well development, and at 12.88 feet two days later.

Based on surface topography and drainage, groundwater at the Property is presumed to flow south and east. Regionally, groundwater flow is expected to be west toward the Alewife Brook [8].

According to the MassGIS Site Scoring Map (Appendix C), the Property is not located within a Zone II Wellhead Protection Area, a Potentially Productive Aquifer (PPA), Sole Source Aquifer, or an Interim Wellhead Protection Area (IWPA) [11]. There are also no public water supply wells within 1-mile of the Property.

There are no wetlands, Natural Heritage and Endangered Species Program Priority or Estimated Habitats of Rare Wildlife, Vernal Pools, Certified Vernal Pools, or Areas of Critical Environmental Concern (ACEC) within 500 feet of the Property [11].

4.4 Historical Use Information on the Property

Property history was obtained from Sanborn Fire Insurance Maps (Sanborn Maps) from 1900 to 1991, aerial photographs received from EDR, taken periodically between 1938 and 2012, and a historical topographic map from 1946 [12, 13, 14]. Sanborn Maps, historical topographic maps, and aerial photographs are in Appendices D, E, and F, respectively.

In 1900, the Property and the adjacent 169 Holland Street property was a stone quarry owned by the City of Somerville. Structures associated with the stone quarry included a dynamite cellar, a stone crusher, sheds, and a steam boiler. However, the dynamite cellar appears to be the only structure located on the Property in what is now the school yard. By 1934, the stone quarry had been filled, and the Property and adjacent 169 Holland Street property were the Shaw Playground, and Western Junior High School, respectively. The source of the material used to fill the quarry is unknown and could potentially contain OHM and constitutes an REC. (Depending on the type and concentrations of OHM, the fill material may also represent a reportable condition under the Massachusetts Contingency Plan (MCP; 310 CMR 40.0000), and/or require management during excavation for construction).

The Property remained a playground until approximately 1972 when the Powder House School was constructed. This is consistent with the aerial photographs that show the playground present from 1938 until 1969 [1, 12, 13]. The Powder House School was used as an elementary school from 1973 until 2004. However, the 1989 and 1991 Sanborn Maps show the school building labelled as “Tufts University” [12].

4.5 Historical Use Information on Adjoining Properties

According to historical documents, including Sanborn Maps from 1900 to 1991 and aerial photographs taken periodically between 1938 and 2012, the Property has been abutted by residences along Broadway and Packard Avenue to the north and west, and residences on Paulina Street to the east since at least 1900. The property at 169 Holland Street, which abuts the Property to the south, was the Western Junior High School from approximately 1917 until at least 1950. The 1989 Sanborn Map shows the Junior High Building as a “Community Center Service”. The school yard west and south of the former school were converted to a parking lot by 1989. The building is currently used by Tufts University for administrative offices [12, 13].

5. Summary of Previous Environmental Reports

We did not identify any previous environmental reports for the Property [5].

6. Site Reconnaissance

As part of the Site reconnaissance, we reviewed information provided by Mr. Vithal Deshpande, the Environmental Coordinator for the City of Somerville on January 22, 2014, and we visited the Property on January 6 and 13, 2014 [2, 5]. The purpose of the site reconnaissance was to collect current Property information, document Property conditions, and observe and document conditions related to the potential presence of OHM [3]. The Property consists of a three-story, slab-on-grade, concrete-masonry former elementary school and an asphalt paved schoolyard [3]. Building Plans are in Appendix G.

During the Property visit, we observed former classrooms, an auditorium, bathrooms, some maintenance spaces, and the loading dock garage. We were unable to access several locked rooms. We also did not access the roof, but parts of it were visible from the 3rd floor. Photographs taken during the Property visit are in Appendix H [3].

6.1 Building Interior Observations

The Powder House School is an approximately 39,136 ft² multi-level (2 and 3 story), concrete-masonry, slab-on-grade structure. The building is currently vacant but is used by the Somerville Department of Public Works to store bicycles. Water leaks and vandalism have caused damage to parts of the interior [3].

The building is constructed around a central interior courtyard that contains small trees and brush, and wood benches on concrete pads. There is second smaller courtyard on the east side of the building adjacent to the 169 Holland Street building. We observed asphalt covered by leaves and small brush in this courtyard [3].

The building interior consists of former classrooms, an auditorium, a cafeteria, a gymnasium, maintenance spaces, bathrooms, courtyards, and a loading dock garage. [3].

There are several utility rooms and storage closets in the Property building. Each floor contains an electrical room and janitor's closet. Utility rooms located on the third floor contained mechanical equipment for the natural gas fired HVAC units located on the roof.

There is one hydraulic passenger elevator in the building. The hydraulic room for the elevator is located on the first floor adjacent to the elevator. We also observed a hydraulic lift in the garage loading dock [3].

The loading dock garage is on the northeast corner of the building [3].

6.1.1 Building Heating

Based on the presence of the natural gas connection observed on the north side of the first floor, building heating and cooling is presumed to be from natural gas fired roof-top units. The City of Somerville Assessors Office lists the building as being heated by oil, but no evidence of a boiler room or fuel tanks was observed during the site visits. The Fire Department also had no information pertaining to oil storage on the Property [1, 3, 15].

We observed a natural gas fired hot water heater in a third floor mechanical room, and a small electric water heater in a closet inside the gymnasium [3].

6.1.2 Stains or Corrosion

We observed some minor black staining in the building beneath three unlabeled empty 5-gallon buckets in the loading dock garage, and on the floor of the electrical room near the garage. The source of the staining in the electrical room is unknown; we did not observe any containers in the room, and none of the electrical transformers appeared to be leaking. The floors in the stained areas were in good condition with no cracks or holes, and we did not observe any floor drains in these areas, and therefore, the staining is unlikely to have migrated beyond the floor and resulted in an REC.

We also observed corrosion associated with water damage throughout the building. The area of most significant corrosion was on the second floor near a water fountain adjacent to the main entrance [3].

6.1.3 Drains or Sumps

We observed floor drains in the bathrooms and adjacent to a stainless steel freezer in the first floor cafeteria. A small metal pipe protruding from the walk-in appeared to discharge to the floor drain. We also observed slop sinks in the janitors closets [3].

6.1.4 Wastewater Disposal

The Property building is connected to the City of Somerville's sanitary sewer system [16].

6.2 Site Exterior Observations

6.2.1 Site Description

The Property is developed with an approximately 39,136 square foot (ft²), multi-level (2 and 3 story) school building and an approximately 35,000 square feet asphalt school yard to the northwest of the building. There is a small landscaped area with trees, brick sidewalk, and concrete benches between the Property and Broadway [3].

6.2.2 *Pits, Ponds, and Lagoons*

No pits, ponds, or lagoons were observed on the Property [3].

6.2.3 *Stained Soil or Pavement*

No significantly stained soil or pavement was observed on the Property [3].

6.2.4 *Odors and Stressed Vegetation*

No unusual odors or stressed vegetation was observed on the Property [3].

6.2.5 *Solid Waste*

No dumpsters were observed on the Property during the Site visit and information regarding past waste disposal was not available [3].

6.2.6 *Wells*

No wells were observed on the Property [3].

6.3 Oil/Chemical Storage

6.3.1 *Current Chemical Storage/Waste Generation*

We observed chemical storage in the loading dock garage. Chemical storage typically consists of cleaning, maintenance and construction products such as paint, finish stripper, and floor wax. We also observe several sealed unlabeled 5-gallon buckets, an open five gallon bucket containing a dark blue-green liquid, and an empty 55-gallon drum. We observed leaks and staining on some containers and the concrete floor beneath them. However, the floors were intact with no cracks or holes, and we did not observe any floor drains nearby, and therefore, the staining is unlikely to have migrated beyond the floor and resulted in an REC.

6.3.2 *Past Chemical Storage/Waste Generation*

No information was available regarding past chemical storage or waste generation at the Property [3].

6.4 On-Site Storage Tanks

6.4.1 *Underground Storage Tanks*

No evidence of USTs was observed on the Property [3].

6.4.2 *Aboveground Storage Tanks*

No evidence of ASTs was observed on the Property [3].

6.5 PCB-Containing Equipment

There were several “dry-type” transformers in the buildings electrical rooms. No evidence of staining or leakage was observed in the vicinity of the transformers. No markings indicating the potential polychlorinated biphenyls (PCB) content of the transformer dielectric fluid were observed on the transformers [3].

Other than the transformers, no equipment suspected of containing PCBs was observed on the Property [3].

6.6 Surficial Dumping

No evidence of surficial dumping was observed at the Property. However, we did observe a desk, a chair, and some children’s toys in the courtyard on the east side of the building [3].

7. Interviews

7.1 Interview with Owner and Property Manager

GEI reviewed information provided to Add Inc. by Mr. Vithal Deshpande [5]. Mr. Deshpande was not aware of operations with the potential to adversely impact the environmental condition of the Property. Information obtained from Mr. Deshpande is presented in Sections 3 and 6 of this Report [5]. .

7.2 Interview with Local Government Officials

We reviewed available files online, requested available files, or reviewed physical files on January 8 and 13, 2014 for the 1060 Broadway parcel from the following City of Somerville offices:

- Assessor's Office
- Board of Health
- Building Department
- Department of Public Works
- Engineering Department
- Fire Prevention Office

Copies of the pertinent records from these offices are in Appendix G.

7.2.1 *Assessor's Office*

The Property is owned by The City of Somerville [1]. Date of purchase and records of previous ownership were not available. Table 1 shows ownership information for the abutting properties.

7.2.2 *Board of Health*

Records for the Property available at the City of Somerville Board of Health included newspaper articles, a report, and correspondence related to air quality issues caused by mold and mildew. Based on available records, the mold and mildew issues were mitigated through HVAC adjustments and replacing building materials such as carpeting [17].

7.2.3 *Inspectional Services Department (ISD)*

Records available for the Property at ISD generally included permits for building renovations and inspection certificates [18].

Records from the ISD indicate that small quantities of OHM may have been used and stored on the Property in the past. According to a report on file at ISD, during a fire drill on June 4, 2002, fire department personnel observed a chemical storage room on the third floor of the building. The room was labeled as an electrical closet and not placarded for hazardous and/or flammable materials. The report cites “numerous flammable, explosive, and reactive chemicals haphazardly and improperly stored on open shelving within the room.” In addition, a small amount of what was presumed to be nitric acid had leaked onto the floor of the closet. The spill did not constitute a reportable condition under the MCP. The City of Somerville subsequently engaged Beacon Environmental to clean up the nitric acid and transfer the chemicals to the DPW Hazmat locker. Given the nitric acid spill did not constitute a reportable condition under the MCP, and that it was contained within a closet on the third floor of the building, it is not considered an REC and is unlikely to affect conditions at the Property [18].

7.2.4 Department of Public Works

No records were available for the Property at the City of Somerville Department of Public Works office [18].

7.2.5 Engineering Department

The Engineering Department maintains records related to surveys, site plans, utilities, and water and sewer connections in the City of Somerville. Records available for the Property included the construction drawings of the building from 1971. Available records at the Engineering Department did not indicate the use or storage of OHM at the Property [16].

7.2.6 Fire Prevention Office

On January 13, 2014, we reviewed records on the file at the City of Somerville Fire Prevention Office regarding the storage of OHM, such as ASTs or USTs, for the Property. Records for the Property generally included fire alarm testing reports, fire code inspection reports, and correspondence. After improper chemical storage was observed during a fire drill in 2002 (Section 7.2.3), a letter, dated June 6, 2002, on file at the Fire Prevention Office indicates that the facility director of the school purchased a fireproof cabinet for proper chemical storage. Records also indicate that the school obtained the required chemical storage permit from the Fire Department. A follow-up inspection of chemical storage practices was scheduled for 2004, but the school had already been closed. No tank permits related to ASTs or USTs were on file at the Department [15].

8. Phase I ESA Findings

GEI Consultants, Inc. completed an ASTM Phase I ESA, on behalf of Add Inc. and Tufts University for the Powder House School located at 1060 Broadway in Somerville, Massachusetts (the Property).

Based on our evaluation of current Property conditions and the review of available Property records, we identified one REC, defined as evidence of past, current or future potential releases of OHM, at the Property:

- The Property is a filled stone quarry. Between 1900 and 1934 the stone quarry was filled. Following the filling, the Property was developed with a playground and school. The source of the material used to fill the quarry is unknown and could potentially contain OHM. Depending on the type and concentrations of OHM, the fill material may also represent a reportable condition under the MCP, and/or require management during excavation for construction.

In addition, we did not identify any HRECs, defined as a past release that has achieved regulatory closure without required controls or conditions, or CRECs, defined as a past release that has achieved regulatory closure with required conditions or controls.

9. Phase I ESA Opinion and Conclusions

Based on the presence of the REC identified in Section 8, we recommended performing an ASTM Phase II ESA to evaluate whether a release of OHM to the environment from the stone quarry fill has affected the Property.

10. Phase II ESA Subsurface Investigation

Between February 14 and 19, 2014, GEI performed a subsurface investigation to evaluate the REC identified in Section 8. The subsurface investigation included:

- Boring advancement and soil sampling
- Groundwater monitoring well installation
- Groundwater sampling

A description of our investigation is below. A summary of geologic and hydrogeologic conditions is provided in Section 4.3.

10.1 Boring Advancement and Soil Sampling

10.1.1 *Sample Collection*

On February 14, 2014, we observed Northern Drill Services (Northern) of Northborough, Massachusetts advance 3 soil borings (B101 through B103) to depths ranging from 7.25 to 16 feet using hollow-stem auger, drive and wash, and rock coring drilling methods. The soil boring locations are shown on Fig. 2 and boring and monitoring well installation logs are in Appendix I.

We continuously logged soil (lithology and physical observations) during drilling and screened soil samples for total volatile organic compounds (VOCs) using the jar headspace method and a photoionization detector (PID). PID field screening results are summarized on the boring logs in Appendix I.

We submitted one soil sample from each of the three borings to AMRO Environmental Laboratories (AMRO) of Merrimack, New Hampshire for analysis of VOCs, semi-volatile organic compounds (SVOCs), total petroleum hydrocarbons (TPH), polychlorinated biphenyls (PCBs), Resource Conservation and Recovery Act (RCRA 8) metals, conductivity, pH, and oxidation-reduction potential. Two samples (B101 and B102) were also tested for lead by the Toxicity Characteristic Leachate Procedure (TCLP) based on the concentrations of total lead detected in the samples. The chemical testing results are summarized in Table 3 and the laboratory data report is in Appendix J.

10.1.2 Findings

10.1.2.1 Geology

During the subsurface investigation we encountered fill and bedrock at the Site. The geology is known only at boring locations and may be significantly different at other locations.

Fill – We encountered a layer of sandy fill that extended to a depth of 7 to 10 feet. This soil was widely graded sand with between approximately 5 and 15 percent gravel and between approximately 15 and 40 percent silt. This layer, which is considered urban fill, included varying amounts of debris, such as brick, concrete, glass, coal, and coal ash.

Bedrock – Bedrock was encountered in all of the borings beneath the fill. Bedrock consists of the Cambridge Argillite.

10.1.2.2 Soil Testing Results

Comparisons of contaminant concentrations to Massachusetts Contingency Plan (MCP; 310 CMR 40.0000) reportable concentrations (RCS-1) are summarized in Table 3. Soil samples collected during this investigation contained detectable levels of SVOCs, and metals including arsenic, barium, chromium, lead, and mercury (Table 3).

- The three soil samples did not contain VOCs, TPH, or PCBs above laboratory reporting limits, and metal concentrations were low (i.e. well below MCP reportable concentrations).
- Boring B103 did not contain SVOCs above laboratory reporting limits. Borings B101 and B102 contained detectable levels of at least one of the following polycyclic aromatic hydrocarbons (PAHs): acenaphthene, anthracene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, bis-2(ethylhexyl)phthalate, chrysene, dibenz(a,h)anthracene, di-n-butyl phthalate, fluoranthene, ideno(1,2,3-cd)pyrene, phenanthrene, and pyrene. Of these compounds, benzo(a)pyrene and dibenz(a,h)anthracene were present at levels above MCP reportable concentrations in boring B102.

The presence of PAHs in soil at concentrations above MCP reportable concentrations may be eligible for a reporting exemption under the MCP as identified in 310 CMR 40.0317(9) and 40.0317(12) due to the presence of coal and coal ash in the fill. The coal and coal ash is likely intrinsic to the fill placed in the historic quarry on the Property.

10.2 Groundwater Monitoring Well Installation

Northern completed one of the three soil borings (B103(MW)) as a 2-inch-diameter polyvinyl chloride (PVC) groundwater monitoring well. The monitoring well location is shown in Fig. 3. The well installation log is included in Appendix I. We developed the monitoring well on February 15, 2014 by purging approximately 3 well volumes from the well, at which point the well ran dry.

10.3 Groundwater Sampling

10.3.1 Sample Collection and Testing

We collected one groundwater sample from the monitoring well on February 17, 2014, using low-flow techniques and submitted the groundwater sample to AMRO for laboratory analysis of VOCs, volatile petroleum hydrocarbon (VPH), and extractable petroleum hydrocarbons (EPH). The groundwater laboratory testing results are in Table 4 and the laboratory data report is in Appendix J.

10.3.2 Findings

The groundwater sample collected from B103(MW) did not contain any VOCs, or VPH analytes above the laboratory reporting limit. The sample contained detectable levels of the EPH fraction C₁₉-C₃₆ aliphatic hydrocarbons, but at a concentration well below MCP groundwater category GW-2 reportable concentrations (RCGW-2).

11. Phase II ESA Summary

We recommended that a Phase II ESA subsurface investigation be performed after identifying an REC. The REC addressed the unknown source of fill materials used when the former stone quarry was filled to create a playground and school.

We conducted a Phase II ESA subsurface investigation to evaluate this REC.

11.1 Findings

Based on the results of the subsurface investigation, we have the following findings:

- A soil sample collected from fill in boring B102 contained polycyclic aromatic hydrocarbons (PAHs) at concentrations that exceed Massachusetts Contingency Plan (MCP; 310 CMR 40.0000) soil category S-1 reportable concentrations (RCS-1). This is a 120-day reporting condition.
- A groundwater sample collected from monitoring well B103(MW) contained C₁₉-C₃₆ aliphatic hydrocarbons at a concentration well below reportable concentrations.

The presence of the PAHs in excess of the RCS-1 is a 120 day reporting condition. The owner of the Property is obligated to notify the Massachusetts Department of Environmental Protection (MassDEP) within 120 days of obtaining knowledge of the release. If the Property is sold prior to notification, the new owner is obligated to report to MassDEP within 120 days of taking ownership.

The presence of PAHs in the soil sample is a reportable concentration; however, due to the presence of coal and coal ash in the fill the release qualifies for a reporting exemption under the MCP as identified in 310 CMR 40.0317(9) and 40.0317(12). Therefore, the owner may elect not to report the release to the MassDEP.

12. Deviations

Limitations and exceptions are discussed in Section 1.4. In addition, we identified the following data gaps associated with the findings of the Phase I and II ESA:

- The absence of historic documents for the Property and its abutters at municipal offices.
- The absence of site-specific groundwater flow information for the Property and surrounding sites.
- The absence of information regarding the material used to fill the stone quarry and to develop the Property into a school. Limited access to locked rooms in the building.

13. Additional Services

We performed a subsurface investigation as part of the Phase II ESA.

14. Environmental Professionals Statement

Resumes for staff involved in the preparation of this report are attached in Appendix K. To the best of our professional knowledge and belief, we meet the definition of an Environmental Professional, as defined in 40 CFR 312.10. We have the specific qualifications based on education, training, and experience to assess a property of the nature, history, and setting of the Property. We have developed and performed all the appropriate inquiries in conformance with the standards and practices set forth in 40 CFR 312.

15. References

- [1] GEI (2014) City of Somerville Assessor's Office online database and visit to the Office on January 8, 2014.
- [2] EDR (2013). The EDR Radius Map[™] Report with Geotcheck[®], Tufts Powder House, 1060 Broadway, Somerville, MA 02144, Inquiry Number 3819301.2s Environmental Data Resources Inc., Milford, Connecticut, December 27, 2013.
- [3] GEI (2014). Site reconnaissance on January 8 and 13, 2014
- [4] Registry of Deeds (2014). Middlesex County South registry of deeds online databases accessed on January 14, 2014.
- [5] GEI (2014). Telephone conversation between Ms. Sun Kim of Add, Inc., and Mr. Vithal Deshpande of the City of Somerville on January 22, 2014.
- [6] MassDEP (2014). MassDEP online database as of January 6, 2014.
- [7] MassDEP (2013). MassDEP Historic Release and Spills database accessed on January 14, 2014.
- [8] USGS (2012). Lexington Quadrangle, Massachusetts, 7.5-Minute Series, 1:24,000, United States Department of the Interior - United States Geological Survey, 2012
- [9] USGS (1983). "Bedrock Geologic Map of Massachusetts," Department of the Interior United States Geological Survey, 1983.
- [10] GEI (2002). Surficial geology transposed from U.S.G.S Open-File Report Map titled "Surficial Geologic Map of the Boston Area, Massachusetts" by C.A. Kaye, OF-78-111, 1978. Legend modified by Wm. Pitt, GEI Consultants, Inc., 2002
- [11] MassGIS (2013). MassGIS, Bureau of Waste Site Cleanup, MCP Numerical Ranking System Map, January 6, 2014.
- [12] EDR (2013). Certified Sanborn[®] Map Report, Tufts Powder House, 1060 Broadway, Somerville, MA 02144, Inquiry Number 3819301.3. Environmental Data Resources, Inc., Milford, Connecticut, December 27, 2013.
- [13] EDR (2013). The EDR Aerial Photo Decade Package, Tufts Powder House, 1060 Broadway, Somerville, MA 02144, Inquiry Number 3819301.5. Environmental Data Resources Inc., Milford, Connecticut, December 27, 2013.
- [14] USGS (1946). Lexington Quadrangle, Massachusetts, 7.5-Minute Series, 1: 24, 000, United States Department of the Interior – United States Geological Survey, 1946
- [15] GEI (2014). Visit to the City of Somerville Fire Prevention Office on January 13, 2014.

- [16] GEI (2014). Visit to the City of Somerville Engineering Department on January 8 and 13, 2014.
- [17] GEI (2014). Visit to the City of Somerville Board of Health and Health Department on January 8 and 13, 2014
- [18] GEI (2014). Visit to the City of Somerville Inspection Services Department on January 8 and 13, 2014.
- [19] GEI (2014). Visit to the City of Somerville Department of Public Works Office on January 8, 2014.

Table 1. Summary of Property Information
Phase I and II Environmental Site Assessment
Powder House School
Somerville, Massachusetts

Subject Property		Abutting Property		
Address	Direction	Address	Parcel ID	Owner
Powder House School 1060 Broadway	Northern Abutters	1081 Broadway	3185	Fraser Kenneth
		1077 Broadway	3184	Spalaris Andreas & Joan
		1 Packard Ave	3173	DiGregorio Mary A
		1067 Broadway	3172	Cath Claire & Samaraweera D Trustees C/O KSS Realty Partners Inc
		1063 Broadway	3171	Stevens Gary W
		1059 Broadway	103416	Gordon Edward A
		1057 Broadway	103415	Sun Nicholas & Rachel
		1055 Broadway	3169	Joseph Cynthia J
	Eastern Abutters	1044 Broadway	3260	Mack Dennis J Trustee
		54 Paulina St	3262	Federico Gildo & Ann J For Life
		48 Paulina St	3263	Neumann Cynthia Ellis Trustee
		46 Paulina St	3264	Jurkiewicz Charles j Sr & Mary A
		44 Paulina St # 1	106764	Donohue Timothy & Jessica
		44 Paulina St # 2	106765	Johnson Brad
	Western Abutter	38 Paulina St	3266	Dias Geraldine Estate Of
		1088 Broadway	3259	Finn Kathleen M
	Southern Abutter	169 Holland St	15443	Tufts University

Notes:

1. Information obtained the City of Somerville's Assessor's Office on-line database on January 8, 2014.

Table 2. MassDEP-listed Disposal Sites and Spills Within 0.5-Mile Radius of the Property
Phase I and II Environmental Site Assessment
Powder House School
Somerville, Massachusetts

MassDEP - RTN	MassDEP Notification Date	Site Name/Location Aid	Address	Distance and Direction from Site (miles)	Hydrologic Relation to Site	Status	EDR Map ID
3-0023287	10/18/2003	No Location Aid	6 Westminster St.	0.111 NW	Upgradient	RAO (A2)	A1
3-0013287	12/21/1995	M W Carr Co., Inc.	63 Gorham Street	0.221 SSW	Downgradient	RAO (A2)	E18
3-0013288	12/21/1995	Waste Treatment Room / Groundwater				RAO (A2)	E19
3-0013289	12/21/1995	M W Carr Co., Inc.				RAO (A3)	E18
3-0013686	4/22/1996	M W Carr Co., Inc.				PHASE IV / INVSUB	E18
3-0013389	4/1/1996	Adjacent to 79 & 81 Newbury St.	Newbury Street	0.230 WSW	Downgradient	RAO (A1)	20
3-0025754	3/23/2006	Not Reported	1194 Broadway	0.233 NW	Cross-gradient	RAO (A2)	F21
3-0020486	2/22/2001	Clarendon Ave	19 Weston Ave	0.236 NW	Cross-gradient	RAO (A3)	F24
3-0026235	9/19/2006	No Location Aid	15 Weston Ave	0.265 WNW	Cross-gradient	RAO (A2)	H25
3-0023163	9/4/2003	No Location Aid	24-30 Howard St.	0.278 S	Downgradient	RAO (A1)	27
3-0029133	3/16/2010	Not Reported	5 Tannery Brook Row	0.278 SSW	Downgradient	RAO Not Required	28
3-0011656	9/28/1994	Substation 469	45 Endicott Ave	0.283 WNW	Cross-gradient	RAO (A2)	H29
3-0028726	9/9/2009	Not Reported	5 Chandler St.	0.293 SSE	Downgradient	RAO (A2)	30
3-0012745	7/28/1995	Davis Square	40 Holland St.	0.305 SSE	Downgradient	RAO (A1)	31
3-0000280	1/15/1987	Not Reported	99 Elmwood St, Cambridge MA	0.316 SSW	Downgradient	No Further Action (DEPNFA)	I33
3-0021565	3/12/2002	No Location Aid	6 Campbell Park Place	0.335 SSW	Downgradient	RAO (B1)	J34
3-0015056	4/30/1997	No Location Aid	45 Kingston St.	0.336 SSW	Downgradient	RAO (A2)	J35
3-0000274	1/15/1987	NEFOR Eng. Manufacturing	1 Camp St., Cambridge MA	0.337 SW	Downgradient	No Further Action (DEPNFA)	36
3-0026318	10/23/2006	Maignon High School	1 Maignon Rd., Cambridge MA	0.346 W	Cross-gradient	RAO (A3)	37
3-0029507	9/13/2010	Corner of Cameron & Mass Ave.	5 Cameron St., Cambridge MA	0.370 SW	Downgradient	RAO (A2)	28
3-0020346	1/24/2001					RAO Not Required	
3-0018951	2/29/2000					Downgradient Property Status	
3-0002170	7/15/1989	Tufts U Jackson Gym	Jackson Gym	0.372 ENE	Downgradient	WCSPRM	39
3-0012805	8/14/1995	Tufts University	Telsa St	0.375 NNE	Upgradient	RAO (A1)	40
3-0010727	3/11/1994	No Location Aid	99-119 Dover St.	0.383 SSE	Downgradient	RAO (B1)	41
3-0002020	4/15/1989	Teele Square Auto	1284 Broadway	0.386 NW	Cross-gradient	Phase V / REMOPS	42
3-0022345	11/22/2002					RAO Not Required	
3-0021947	7/18/2002	Edmunds St.	2485 Massachusetts Ave, Cambridge, MA	0.403 WSW	Downgradient	RAO Not Required	K43
3-0022381	12/10/2002	No Location Aid	2495 Massachusetts Ave., Cambridge MA	0.409 WSW	Downgradient	RAO (B1)	K44
3-0023756	4/13/2004					Downgradient Property Status	
3-0025766	3/28/2006					URAM	
3-0025467	7/8/2005					RAO (B1)	
3-0021567	3/4/2002	Not Reported	2500 Massachusetts Ave., Cambridge MA	0.413 WSW	Downgradient	RAO (B1)	K45

Table 2. MassDEP-listed Disposal Sites and Spills Within 0.5-Mile Radius of the Property

Phase I and II Environmental Site Assessment

Powder House School

Somerville, Massachusetts

MassDEP - RTN	MassDEP Notification Date	Site Name/Location Aid	Address	Distance and Direction from Site (miles)	Hydrologic Relation to Site	Status	EDR Map ID
3-0020305 / 3-0020315	1/12/2001	NSTAR Electric Power Substation	Edmunds St & Massachusetts Ave Corner, Cambridge MA	0.415 WSW	Downgradient	RAO (A2)	K46
3-0022369	1/19/2007	No Location Aid	2505 Massachusetts Ave., Cambridge MA	0.417 WSW	Cross-gradient	RAO (A2)	L47
3-0010698	1/25/1994	No Location Aid	16 Edmunds St., Cambridge MA	0.423 WSW	Downgradient	Downgradient Property Status	K48
3-0020420	2/22/2001	Not Reported	2366 Massachusetts Ave., Cambridge MA	0.423 WSW	Downgradient	RAO (A1)	49
3-0024855	11/8/2005	(Former) Mass Ave Firestone Inc.	2472-2484 Massachusetts Ave., Cambridge MA	0.425 WSW	Downgradient	RAO Not Required	K50
3-0013232	12/6/1995					RAO (A3)	
3-0024298	10/5/2004					RAO Not Required	K51
3-0022811	4/24/2003					RAO Not Required	K52
3-0015438	8/6/1997	Churchill Ave Intersection	2519-2529 Massachusetts Ave., Cambridge, MA	0.426 WSW	Cross-gradient	Downgradient Property Status	L53
3-0000997	1/15/1990	Fawcett Services Inc.	Tyler Ct., Cambridge MA	0.451 WSW	Cross-gradient	RAO (A2)	54
3-0014084	8/1/1996	Housing Development	278 Powderhouse Blvd.	0.475 NW	Cross-gradient	RAO (A2)	55
3-0014098	8/6/1996					RAO (A2)	
3-0015757	11/24/1997	No Location Aid	2557 Massachusetts Ave., Cambridge MA	0.479 WSW	Cross-gradient	RAO (A3)	56
3-0015428	8/16/1997	Not Reported	131 Orchard St.	0.493 S	Downgradient	RAO (A2)	57

General Notes:

- Distances and directions from the Property are approximate and were either obtained from the Environmental Data Resources (EDR) report or by review of street maps of the area.
- Hydrologic relation to the Property is assumed, based on a review of the topography of the area, the location of surface water bodies, and information obtained from EDR.
- Information regarding spill date, notification date, status and material released from the MassDEP databases, as of December 31, 2013.
- RAO = Response Action Outcome.
A1 = A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.
A2 = A permanent solution has been achieved. Contamination has not been reduced to background.
A3 = A permanent solution has been achieved. Contamination has not been reduced to background and an Activity and use Limitation (AUL) has been implemented.
B1 = Remedial actions have not been conducted because a level of No Significant Risk exists.
- RTN = Release Tracking Number.
- DEPNFA = No further action required by MassDEP.
- URAM = Utility-Related Abatement Measure.
- WCSPRM = Waiver Completion Statement Permanent

Table 3. Laboratory Testing Results - Soil
Phase I and II Environmental Site Assessment
Powder House School
Somerville, Massachusetts

				Sample Location:		B101		B102		B103	
				Sample ID:		1332630-B101	1332630-B101-S4	1332630-B102	1332630-B102-S3	1332630-B103	1332630-B103-S3
				Sample Date:		2/14/2014	2/14/2014	2/14/2014	2/14/2014	2/14/2014	2/14/2014
				Sample Depth (ft):		6-10'	8-10'	2.5-7.25'	4-6'	2-6'	4-6'
MCP RCS-1											
Analyte	Method	Units									
Volatile Organic Compounds (VOCs)	8260C	mg/kg				NT		NT		NT	
Total VOCs			NS				ND		ND		ND
Semi-Volatile Organic Compounds (SVOCs)	8270D	mg/kg					NT		NT		NT
Acenaphthylene			1			<0.280		0.45		<0.280	
Anthracene			1,000			<0.280		0.84		<0.280	
Benzo(a)anthracene			7			0.95		3		<0.280	
Benzo(a)pyrene			2			0.92		2.9		<0.280	
Benzo(b)fluoranthene			7			0.74		2		<0.280	
Benzo(g,h,i)perylene			1000			0.61		1.8		<0.280	
Benzo(k)fluoranthene			70			0.79		2.7		<0.280	
bis(2-Ethylhexyl)phthalate			NS			0.410 B		0.52		<0.280	
Chrysene			70			1.00		3.2		<0.280	
Dibenzo(a,h)Anthracene			0.7			<0.280		0.79		<0.280	
Di-n-butylphthalate			50			0.38		<0.360		<0.280	
Fluoranthene			1,000			1.6		4.9		<0.280	
Indeno(1,2,3-cd)Pyrene			7			0.55		1.6		<0.280	
Phenanthrene			10			0.91		2.8		<0.280	
Pyrene			1,000			1.6		4.8		<0.280	
Total SVOCs			NS			10.46		32.30		ND	
Total Petroleum Hydrocarbons (TPH)	8015M	mg/kg	1,000			ND	NT	ND	NT	ND	NT
Polychlorinated Biphenyls (PCBs)	8082	mg/kg					NT		NT		NT
Total PCBs			2			ND		ND		ND	
Total Metals		mg/kg					NT		NT		NT
Arsenic	6010C		20			<0.675		10.2		<6.64	
Barium	6010C		1,000			34.1		72.2		41.1	
Chromium (Total)	6010C		30 (1,000)			16.4		21.6		16	
Chromium (Hexavalent)	7196A		30			NT		NT		NT	
Lead	6010C		300			132		114		21.4	
Mercury	7471B		20			<0.0549		0.0881		<0.0523	
TCLP Metals							NT		NT		NT
Lead	6010C	mg/L	5			<0.25		<0.25			
Other							NT		NT		NT
Conductivity	9050A	umhos/cm	NS			210		1700		3100	
Corrosivity (pH)	9045C	S.U.	NS			8.8		6.5		5.6	
Redox Potential	ORP	mv	NS			201		202		216	
Percent Moisture	D2216	%	NS			9.6		30.2		11.1	

General Notes:

1. In general, analytes detected in at least one sample are reported here. For a complete list of analytes see the laboratory data sheets.
2. "<" = The analyte was not detected at a concentration above the specified laboratory reporting limit.
3. MCP = 310 CMR 40.0000 Massachusetts Contingency Plan with revisions effective June 26, 2009.
4. Reportable Concentrations (e.g., RCS-1), where identified, are cited from the MCP.
5. RCS-1 for total chromium is 30 mg/kg in the absence of hexavalent chromium data and 1,000 mg/kg if hexavalent chromium data exists.
6. NS = No standard or criteria has been established for this analyte.
7. NT = The sample was not tested for this analyte.
8. ND = The analyte was not detected in the sample.
9. Soil samples for VOC analysis were preserved in the field with methanol.
10. umhos/cm = micromhos per centimeter
11. mg/kg = milligrams per kilogram
12. SU = standard units
13. mv = millivolts

Qualifying Notes:

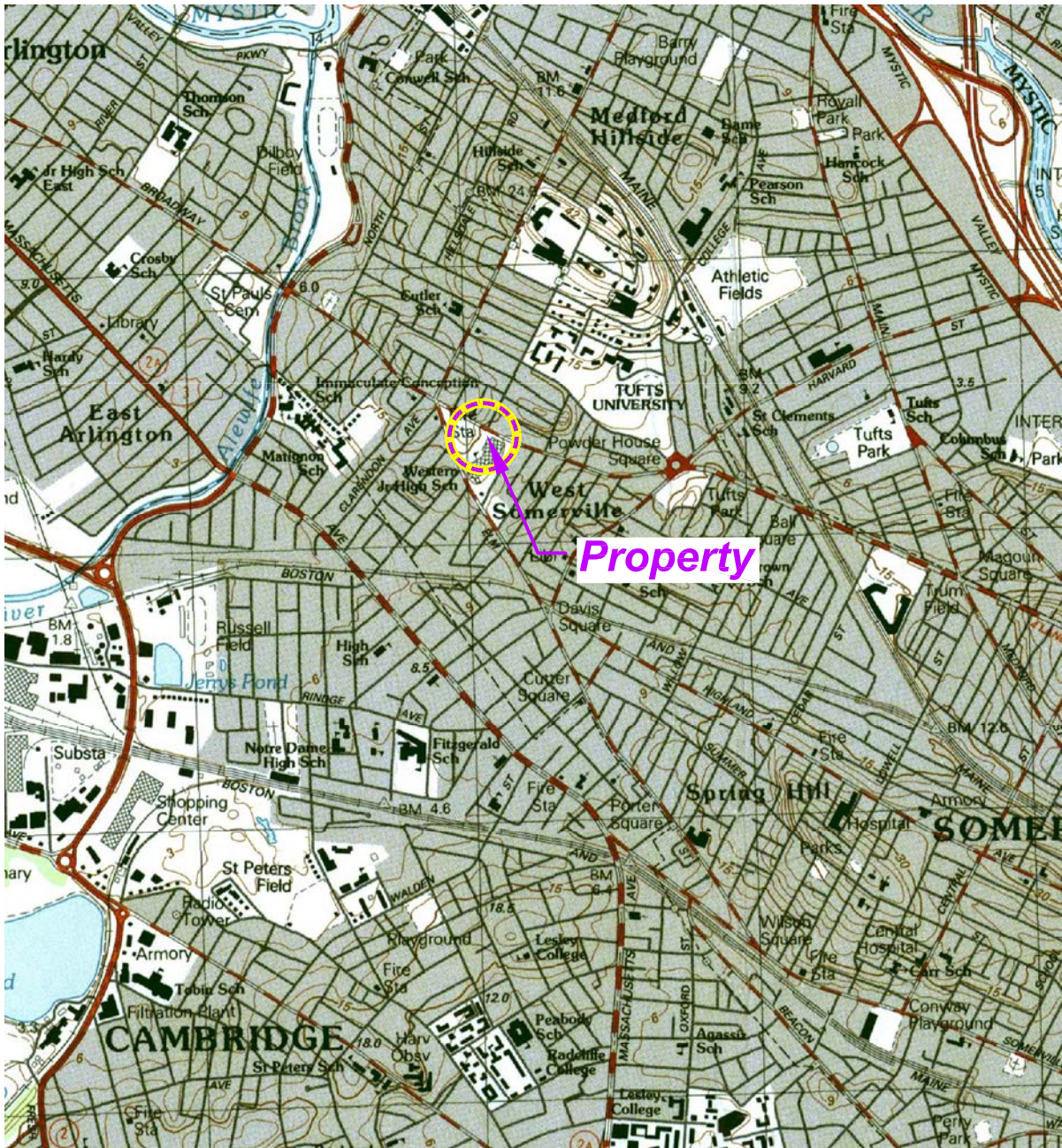
- B The reported result is attributed to sampling or laboratory contamination.

Table 4. Laboratory Testing Results - Groundwater Samples
Phase I and II Environmental Site Assessment
Powder House School
Somerville, Massachusetts

Location: Well Screen Depth (feet): Sample Date:				B103 2-17' 2/17/14
Analyte	Method	Units	MCP RCGW-2	
Volatile Organic Compounds (VOC)	8260	ug/L	NS	ND
Volatile Petroleum Hydrocarbons (VPH)	MADEP VPH 1.1	ug/L		
C5-C8 Aliphatics			3,000	<100
C9-C12 Aliphatics			5,000	<100
C9-C10 Aromatics			7,000	<100
Extractable Petroleum Hydrocarbons (EPH)	MADEP EPH 1.1	ug/L		
C9-C18 Aliphatics			5,000	<160
C19-C36 Aliphatics			50,000	330
C11-C22 Aromatics			5,000	<160

General Notes:

1. Analytes detected in at least one sample are reported here. For a complete list of analytes see the laboratory data sheets.
2. "<" = The analyte was not detected at a concentration above the specified laboratory reporting limit.
3. MCP = 310 CMR 40.0000 Massachusetts Contingency Plan with revisions effective June 26, 2009.
4. GW-2 Reportable Concentrations (e.g.,RCGW-2) are cited from the MCP.
5. ug/L = micrograms per liter.



This Image provided by MassGIS is from U.S.G.S.
 Topographic 7.5 X 15 Minute Series
 Boston North, MA Quadrangle, 1985.
 Datum is National Geodetic Vertical Datum (NGVD).
 Contour Interval is 3 Meters.



ASTM Phase I and II Environmental Site Assessment
 Powder House Community School
 Somerville, Massachusetts

ADD, Inc.
 Boston, Massachusetts

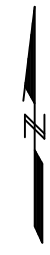


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PROPERTY
 LOCATION MAP

March 2014

Fig. 1



GOOGLE EARTH IMAGE DATED 8/24/2013.

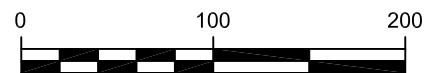
LEGEND:



BORING BY GEI, FEBRUARY 2014



MONITORING WELL BY GEI, FEBRUARY 2014



APPROXIMATE SCALE, FEET

ASTM Phase I and II Environmental Site Assessment
Powder House Community School
Somerville, Massachusetts

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Boston, Massachusetts



Project 133263-0

PROPERTY
LOCATION PLAN

March 2014

Fig. 2

Appendix A

GEI Standard Terms and Conditions